

## Biological Waste Management

Biological and biohazardous materials are routinely used in research laboratories throughout the Rice University campus. When laboratories have completed their investigation those materials must be disposed of according to federal, state, and local guidelines. The Texas Commission on Environmental Quality (TCEQ) has guidelines that pertain to the generation, storage and disposal of biological and biohazardous materials. This document and procedures described within are intended to assist laboratories in the management and disposal of the biological and biohazardous materials

### Definitions

**Biological hazard (biohazard)** - An agent of biological origin that has the capacity to produce harmful effects on humans and the environment.

**Biological waste**- Unwanted solid or liquid material which may be composed of or contaminated with biological or biohazardous materials.

### Recombinant DNA (rDNA) :

- (i) molecules that a) are constructed by joining nucleic acid molecules and b) that can replicate in a living cell, i.e., recombinant nucleic acids;
- (ii) nucleic acid molecules that are chemically or by other means synthesized or amplified, including those that are chemically or otherwise modified but can base pair with naturally occurring nucleic acid molecules, i.e., synthetic nucleic acids, or
- (iii) molecules that result from the replication of those described in (i) or (ii) above.

This may include but not limited to:

- Discarded cultures and stocks of microbiological, infectious agents and associated biologicals
- Discarded cultures of specimens from medical, pathological, pharmaceutical, research, clinical, commercial, and industrial laboratories.
- Discarded live and attenuated vaccines, but excluding the empty containers thereof.
- Discarded, used disposable culture dishes.
- Discarded, used disposable devices used to transfer, inoculate, and mix culture.
- Plants and soil contaminated with organisms modified with rDNA
- Materials used for and in contact with rDNA materials.

All biological and biohazardous waste must be treated before disposal either on or off site.

## **On-Site Treatment**

### **Steam Sterilization (autoclaving)**

1. Place the waste in a plastic or metal autoclave bin.
2. Place a strip of autoclave tape on the bag, or on the biohazard symbol if applicable, of the waste before beginning the sterilization cycle.
3. Use the following program parameters.
  - a. minimum temperature of 121°C
  - b. pressure above 15 psi
  - c. dwell time of at least 30 minutes
    - i. porous materials and larger loads may need a pre-vacuum cycle and/or increase the dwell time, temperature, and pressure.
  - d. fill in your information on the autoclave log book.

### **Chemical Disinfection**

Use a chemical agent which is registered with the EPA as a disinfectant and in accordance with the manufacturer's instructions or

Immerse/combine the waste for not less than 20 minutes in:

1. Freshly prepared solution of 10% v/v household bleach and water. Bulk solutions can be diluted with bleach to achieve the 10% concentration.
2. Solution of 70% by volume isopropyl or ethyl alcohol (solid waste which has been immersed/combined with a liquid disinfectant must be thoroughly drained before disposal).

### **Disposal of Treated Biological Waste**

Biological waste must be treated in accordance with one of the acceptable methods listed above.

1. If treated waste is in a liquid form, dispose through the sanitary sewer after chemical disinfection with copious amounts of water.
  - a. If there is a chemical component to the waste it must be treated as chemical waste.
2. If treated waste is solid after treatment
  - a. Place a sticker noting that the material has been decontaminated on the autoclaved bag.
  - b. Place the waste in an opaque or black trash bag.
  - c. Tie the top and discard in the trash.
3. Make sure to deface any biohazard symbols before disposal.

## Off-Site Treatment

Wastes to be transported off-site for treatment must be packaged securely in regulated medical waste box (RMW) containers available at the George R Brown (GRB) or Bioscience Research Collaborative (BRC) loading docks.

## Disposal of Untreated Biological Waste

1. Waste container must be filled and weight no more than 40 pounds
2. The red interior liner must be hand-tied closed and the top of the box must be securely folded shut. If the waste material is frozen or had the potential to leak, you must use two red bed liners before folding shut.
3. Write the name of your principal investigator and phone extension on the exterior of the box.
4. Fill out the Hazardous Waste Pickup form or leave the box in the
  - a. BRC - Cold Storage Room off of the Loading Dock
  - b. Main Campus - GRB Loading Dock

Before beginning work with any biological materials e.g. toxins, prions, either resistant to chemical or heat sterilization/degradation please consult Rice EHS.